

### **REMARKS**

The Office Action dated February 4, 2003 has been received and carefully noted. The above amendments and the following remarks, are submitted as a full and complete response thereto. This amendment format complies with the amendment format set out in OG Notice at 1267 OG 106, published on February 25, 2003. These amendments were discussed in a personal interview on May 7, 2003, between applicant's representatives and Examiners Luk and Walker. Applicant appreciates the Examiner's courtesy in conducting the interview.

Claims 1, 15 and 25 have been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added. Claims 13 and 14 having been withdrawn from consideration, claims 1-3, 5-12, 15-17, and 19-26 are respectfully submitted for consideration.

As a preliminary matter, the Official Action requested affirmation of the telephone election which was made on November 19, 2002. Applicant hereby affirms the election to prosecute claims 1-12 and 15-26, drawn to a product ejecting apparatus. This election is made without traverse.

Claims 1-8, 11, 12, 15-22, 25, and 26 were rejected under 35 USC § 103(a) as being unpatentable over Yamaguchi in view of Shimazu. Claims 9 and 23 were rejected under 35 USC § 103(a) as being unpatentable over Yamaguchi in view of Shimazu and further in view of Fujishiro. Claims 10 and 24 were rejected under 35 USC § 103(a) as being unpatentable over Yamaguchi in view of Shimazu, and further in view of Heindl.

Applicant respectfully submits that each of presently pending claims 1-3, 5-12, 15-17, and 19-26 recite subject matter which is neither disclosed nor suggested in the cited prior art.

Claim 1, upon which claims 2, 3, and 5-12 are dependent, is directed to a product ejecting apparatus for an injection molding machine. The apparatus comprises a first drive unit and a first transmission unit connected to the first drive unit. A rotation of the first drive unit results in a rotation of the first transmission unit. A second drive unit is provided, and is connected to a second transmission unit. A rotation of the second drive unit causes a rotation of the second transmission unit. An ejector pin is configured to reciprocate based upon a motion of the first transmission unit. A working member is connected to the second transmission unit. A movement of the second transmission unit results in reciprocating movement of the working member. The first and second transmission units together comprise a single motion conversion unit.

Independent claim 15, upon which claims 16, 17, and 19-26 are dependent, recites a product ejecting apparatus comprising a first drive means for providing drive power for an injection molding machine, and a first transmission means connected to the first drive means. A rotation of the first drive means results in a rotation of the first transmission means. The first transmission means transmitting power from the first drive means. A second drive means provide drive power, and a second transmission means is connected to second drive means. A rotation of the second drive means causes a rotation of the second transmission means. An ejection means is configured to reciprocate based upon a

motion of the first transmission means. A working member is connected to the second transmission means. A movement of the second transmission means results in reciprocating movement of the working member. The first transmission and the second transmission means together comprise a single motion conversion means for converting motion.

As a result of the claimed invention, an effective and efficient product ejecting apparatus is provided wherein a working member and ejector pin can operate concurrently, and, in conjunction with the other elements of the invention, shorten molding cycle times. It is respectfully submitted that the cited prior art of Yamaguchi, Shimazu, Fujishiro, and, and Heindl, fail to disclose or suggest the claimed invention.

Yamaguchi discloses a control device for an ejector mechanism used in an injection molding machine. Fig. 2 of Yamaguchi discloses a servomotor 30 serving as a driving source of the ejector mechanism which is rotatable in a normal mode and a reverse mode. The servomotor 30 has an output shaft coupled to a gear 31. The rotation of the gear 31 is transmitted through a belt 32 to another gear attached to a ball screw. A guide plate 37 is fixedly coupled by eject nuts 38 to a plurality of eject rods 39 and is engaged with one end of a threaded portion of the ball screw 33. With this structure, the guide plate 37 and the eject rods 39 are moved forward or backward along guide bars 36 in response to normal or reverse revolution of the ball screw 33.

Shimazu discloses an apparatus for making a plurality of optical record disc substrates. Cavity bodies 1 (fixed mold half) and core bodies 2 and outer peripheral rings

3 (moveable mold half) form two disc-shaped cavities A in an injection molding mold 18. The core bodies 2 are provided with hydraulic actuation mechanisms having compression cylinders 11. The respective compression cylinders 11 are arranged to communicate with hydraulic control circuits 20 including hydraulic control valves 19 which can control the cylinders in an independent and multi-stage manner. The actuation of the core bodies 2 can be independently done in a multi-stage control with a combination of a hydraulic pressure and timing. The hydraulic actuation mechanisms including the compression cylinder are operationally connected to the moveable core body 2 through one or a plurality of core blocks 4, 4' in order to slide the core body 2. Cut punch cylinders 12 and ejection cylinders are connected to cut punches 5, ejection pins 9 and ejection sleeves 8 through blocks 10 in order to slide the cut punches, the ejection pins and the ejection sleeves.

It is respectfully submitted that the combination of Yamaguchi and Shimazu fails to disclose or suggest the elements of any of independent claims 1 and 15, and therefore fails to disclose or suggest the elements of any of the dependent claims.

Independent claim 1, as mentioned above, recites a configuration wherein a first transmission unit is configured such that a rotation of the first drive unit results in a rotation of the first transmission unit, and a second transmission unit wherein a rotation of the second drive unit causes a rotation of the second transmission units. The first and second transmission units are recited as comprising a motion conversion unit, as discussed in the present specification as having threads on the second transmission

member 78 being an engagement with ball screw shaft portion 115 of first transmission unit 112. This configuration is also exemplary of the first transmission means and second transmission means of claim 15, which comprise motion conversion means for converting motion. Yamaguchi and Shimazu, when viewed either singly or in combination, fail to disclose or suggest such a configuration. As noted in Shimazu, the main feature of the apparatus disclosed therein is the independent actuation of hydraulic cylinders 11. There does not appear, therefore, to be any connection between core bodies 2 and the hydraulic actuation mechanisms 1 therein. Therefore, the combination of Yamaguchi and Shimazu cannot be interpreted as disclosing or suggesting a configuration wherein first and second transmission units comprise motion conversion units.

As noted previously, claims 9 and 23 were rejected under 35 USC § 103(a) as being unpatentable over Yamaguchi in view of Shimazu, and further in view of Fujishiro. Fujishiro is cited as teaching an ejector in an injection molding machine wherein a spring acts as a biasing means to help limit the axial movement of the transmission device. The Office Action took the position that it would have been obvious to a person of ordinary skill in the art to modify Yamaguchi with the spring of Fujishiro, to yield the claimed invention.

Claims 9 and 23 recite the movement restricting unit and/or movement restricting means as comprising brakes. It is not seen how the elements of Fujishiro, even as interpreted in the Office Action, can be interpreted as disclosing or suggesting any types

of brakes. It is therefore respectfully requested that, if this rejection is to be repeated, that a new, non-final Office Action be issued.

Applicant does note that claims 10 and 24 are directed to a movement restricting unit or movement restricting means comprising at least one spring. In the event that this rejection is intended to apply to claims 10 and 24 instead of claims 9 and 23, applicant respectfully submits that Fujishiro fails to cure the significant deficiencies which are discussed above with respect to Yamaguchi and Shimazu.

Fujishiro discloses a method for controlling an ejector and injection molding machine. The injection molding machine includes a return pin 18 and a return spring 19 disposed to enclose the return pin 18 for biasing an upper ejector plate 6 rearwardly. An ejector rod 26 is disposed at the rear end of the lower ejector plate 7 and driven by a driving device 54 for advancing and withdrawing movement into and out of contact therewith. The driving device 54 comprises, for example, an ejector cylinder. Applicant respectfully submits that attempting to apply the elements of Fujishiro to the subject matter of claims 9 and 23 does not provide a basis upon which to reject these claims.

Claims 10 and 24 were indicated in the Office Action as being rejected under 35 USC § 103(a) as being unpatentable over Yamaguchi in view of Shimazu, and further in view of Heindl. Heindl is cited in this rejection as disclosing brakes to allow for holding of a drive unit. As discussed above with respect to claims 9 and 23, in this rejection Heindl is discussed as teaching brakes. However, claims 10 and 24 are directed to the movement restricting unit or movement restricting means comprising a spring. This

rejection, therefore, is erroneous on its face. However, Heindl, like Fujishiro, fails to cure the deficiencies which are discussed above with respect to Yamaguchi and Shimazu.


Heindl discloses a closing unit for form tools of an injection molding machine. The closing unit includes a threaded spindle 15 engaging at the cross head 14 non-rotatably thereto or rotationally secured thereto, which is meshing with a nut 16 which is received in the drive support plate 4 to be axially non-displaceable, however, rotationally drivable. The nut 16 is coupled to the hollow shaft 17 of an electromotor 18 for the purpose of its being driven. The threaded spindle 15 can be screwed out from the nut 16 in the rearward direction. An electromotor 22 is also provided for driving a tool installation height adjustment device 21 and sits in the drive support plate and is flanged thereto. By operating the electromotor 22 the spacing of the drive support plate 4 relative to the mold support or base plate 2 of the closing unit 1 can be varied by means of the tool installation height adjustment device 21. It is respectfully submitted that no combination of Yamaguchi, Shimazu, Fujishiro, and/or Heindl discloses or suggests the elements of any of the independent or dependent claims which are pending in this application. It is respectfully submitted that claims 1-3, 5-12, 15-17, and 19-26 each recite subject matter which is neither disclosed nor suggested in the cited prior art. Applicant submits that this subject matter is more than sufficient to render the claimed invention unobvious to a person of ordinary skill in the art. During the interview of May 7, 2003, there was a preliminary agreement on this issue pending a final search by the

Examiner. It is therefore respectfully requested that these rejections be withdrawn, these claims found allowable, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

  
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Enclosures: Petition for Extension of Time (1 month)  
Information Disclosure Statement